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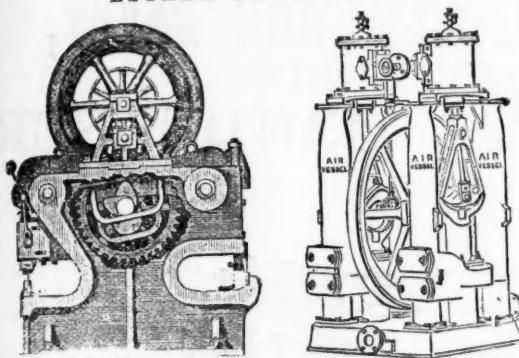
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No. 2075.—VOL. XLV.

LONDON, SATURDAY, MAY 29, 1875.

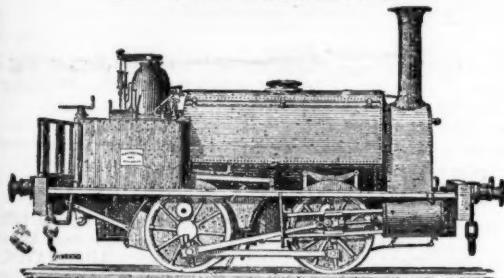
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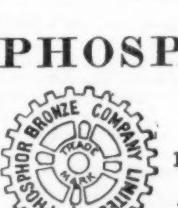
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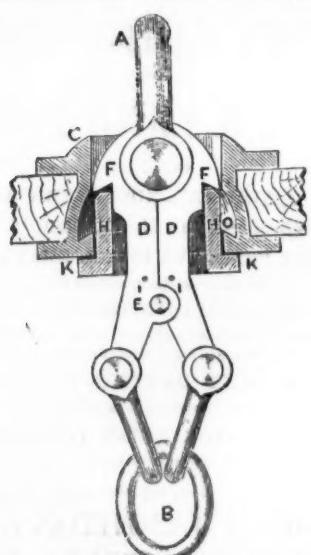
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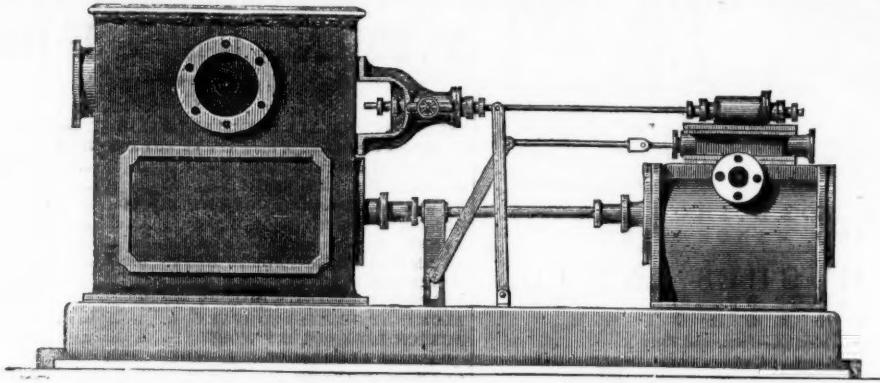
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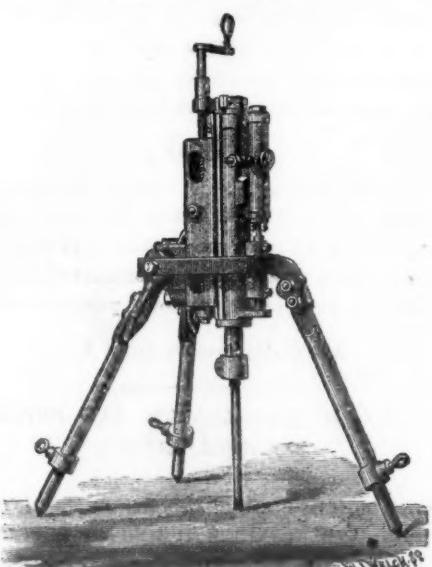
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Original Correspondence.

SOUTH YORKSHIRE MINERS, AND THEIR EMPLOYERS.

Sir.—Your readers must be sorely puzzled to understand the state of things in South Yorkshire between the colliery proprietors and their men, by references from time to time given in your columns to their difficulties. One day shocked by the not unfrequent news of an explosion with the loss of many lives, caused probably through the working of a well-known fiery and dangerous seam with naked lights. And another day we are surprised to learn that the men have struck work because the owners have at last been induced to abolish naked lights and to introduce safety-lamps, in the hope that in the future they may be saved from disasters growing out of explosions; but the men thereupon demanded an advance in their wages, when there is more safety and less danger. And the last announcement is that one of the kindest and best masters in the county has been driven to close one of his large pits rather than submit to the apparently inconsistent requirements of those whose personal safety, one would suppose, had been the sole motive for the change being made. There is another inconsistency worth noticing, where pits are so dangerous from gas that safety-lamps are necessary, but, inexplicable as it may appear, the coal is allowed to be blown down by exploding gunpowder, and this practice has cost the sacrifice of many valuable lives. Surely it is time that this dangerous and absurd practice should be stopped. The use of explosives in coal mines is, in my opinion, totally unnecessary, and I have studied the question for many years.

WILLIAM FIRTH.

Leeds, May 26.

COAL-CUTTING MACHINERY.

Sir.—Mr. Firth's last letter throws little or no fresh light on the subject under discussion; it is chiefly devoted to personal remarks about myself, and the reiteration of statements the fallacy of which have already been exposed. He seems to imagine that all he thinks well to say in favour of the pick-machine is to be taken as fact, without question; but that no statement showing the superiority of the rotary machine is to be believed, although attested by several witnesses. When asked for data respecting the actual working of his machine, he makes an excuse for withholding it, and asks for more concerning the rotary. Mr. Firth further asserts, in a paragraph remarkable for its assurance, that he has endeavoured, with "fairness and to the best of his judgment," to give his opinion on the question put to him by you in the first instance, and that "he is not aware that he has at any time set up for his own invention more than that it is at least equal to the best of its rivals." Now, it is very evident that Mr. Firth's memory is defective; I must try and refresh it. You, Sir, invited this correspondence, and asked Mr. Firth to give his opinion on "the relative merits of the pick and circular saw principles." Mr. Firth, in reply to this invitation, writes you on April 13, in which, although he does not entirely ignore the existence of rotary machines in this country, he keeps all reference to them in the background, although in his position it is impossible he should have been ignorant of the fact that more than one machine was doing really good work, and claimed to be fully equal, if not superior, to his; yet he confines himself to a comparison between his machine and a new American invention, the "Monitor," showing that by continuous working, without hitch or stop, the pick can undercut 100 tons per day of 10 hours, at a cost of 1 1/2d. for air for every ton of coal; whilst the Monitor could only do 50 tons in the same time, at a cost of 15d., showing a difference of 11d. per ton in favour of the pick principle.

This was intended by Mr. Firth to go forth to the world as an unbiased examination into the merits of the pick and rotary systems, and would probably have done so had I not interfered and prevented such unfair and partial statements going unchallenged. I there showed that by adopting Mr. Firth's formula, and his assumption of continuous work, &c., the same as nearly as possible as he had done for the two machines he compared, that a rotary machine was capable of cutting 340 tons per day of 10 hours, at a cost of 8-12ths of a penny per ton. I well knew that in doing this I had not undertaken a very thankful office, but it was a duty due to the patentees, as well as to myself, and to colliery proprietors; I have endeavoured to do it with firmness and truthfulness, and am quite willing to have my statements examined into by any impartial man connected with the trade. The results of the investigation so far, after sifting out a great deal of superfluous matter, which for purposes of comparison only tend to bewilder and mislead, are very satisfactory to me, and establishes the fact that the rotary for all ordinary purposes of coal cutting has large advantages over the pick principle. This, however, is likely to be further proved, as I shall be glad to meet Mr. Firth at a trial of the machines at Adwalton, provided Mr. Parker will permit it. I object, however, to the introduction of a money bet; I never yet deposited stakes on anything, and am not going to begin now; if the trial is to take place the machines must be fairly tested on their merits, and on this ground I am prepared to accept the challenge.

I must now shortly refer to Mr. Firth's letter and that of his engineers. I must, however, leave these gentlemen to look to Mr. Firth for solace to their wounded feelings. It is impossible to reconcile the statements made by Mr. Firth, based on their report, with those made by Messrs. Parker and Tait, and the facts gathered by my son when he went to Adwalton, as well as a considerable experience with the machine at other places. Yet Mr. Firth again repeats some of them. First as to air pressure. His remarks about a 30-horse power engine to drive one coal-cutter, and endeavouring to throw the cost of the working of that engine on to the coal-cutter, is simply absurd. The engine and air-compressor were there before I was applied to for a machine—perhaps put down to drive the machine they had been applying to Mr. Firth for. I have no doubt that the 24 lbs. pressure named by Mr. Parker is ample for the work done there by our machine. The 200 yards of 2-in. pipe named by your representative goes far to explain the difference between the pressure in the engine-house and at the coal face. Again, Mr. Parker clearly says in his letter that there are no ends to cut out, and gives the reason why; and I cannot charge to the daily cost of working the machine, work incident to the way in which the colliery engineer has considered it most to his advantage to lay out his pit. Neither have I in the comparison made charged this end cutting to Mr. Firth, though he says I have done so.

The same applies to roads. Our machine at Adwalton works on and travels on the road as laid for the pit tubs to run on (see again Mr. Parker's letters); therefore, no charge for road laying can be made to the account of the machine. But in this case Mr. Firth's is different; his machine, as I am on good authority informed, does not work on these ordinary pit roads, but has a special road laid for it (I was, no doubt, wrong in saying rails in my last); therefore, I have in fairness charged him with the cost. I have not charged anything separately for removing the machine, as it is already charged in the time occupied by the three men engaged on the machine; but I have charged it to Mr. Firth's machine, as it does not appear to be charged otherwise, the whole of the 10 hours being occupied in cutting. The price at which the labour is charged is in each case the same as Mr. Firth put it at in his former letter, and the cost of the air reckoned at the same as he put it at the first. I have now done with Mr. Firth's chapter on "Peculiar Ethics."

One other point in Mr. Firth's letter I must notice. After referring to a statement of work done by the Gillott and Copley machine, as furnished by a "Mining Engineer," and the Baird machine, he makes this comparison—the "Baird" 5 yards per hour, the "Gillott and Copley" 6 1/2, and the "Pick" 7 1/2 yards. Now, it was exactly the information to enable this comparison to be fairly made that Mr. Firth has been asked to supply, but he is unable to do so. The machine, he says, works so irregularly—some days not at all, others for two or three shifts, and sometimes in very difficult formations; so we don't get the information. However, he used the table sent him, which includes irregularities, reckons it out to an average, and compares that with his 7 1/2 yards per hour, which, as I have shown in a former letter, is the result of continuous working, and claims

this as a triumph for the pick. Since this correspondence has been in progress, I have had an opportunity of seeing the Gillott and Copley and the Baird machines working at the same coal face. It was very hard and difficult stuff to cut. The Baird did about double what he states, and our machine about 50 per cent. more than it; so that in ordinary house coal-cutting, such as we have been discussing, the figures per hour would stand—the Pick, 7 1/2 yards; Baird's (say) 12 at least; the Gillott and Copley, 20 yards.

This again shows the superiority of another type of rotary machine over the pick. It is manifestly unfair in the absence of the useful statistics (which he had been asked to supply) to compare an average of four months' work, including stoppages and delays, with what he thinks is the rate of the pick machine in ordinary measures. I regret that this letter should have been almost entirely taken up with exposing the way in which Mr. Firth has treated your request even from the very first, but it was impossible to allow this kind of correspondence to go further; it was simply a loss of time to me, and space in your Journal. I do not intend to write you again, unless it be shortly, to correct any misstatement, should such appear.—Sheffield, May 27.

ISAAC GRAY BASS.

COAL-CUTTING MACHINERY.

Sir,—I feel sure it must be a source of regret to your readers that a correspondence which promised to throw so much light on mechanical coal-cutting practice should have degenerated into a mere squabble between the patentees of two different machines. The question is a most important one, and if dealt with at all must be dealt with on a broad basis. This Mr. Firth has done more in his last than in his previous letters, and it is much to be hoped that the question now having been fairly started all those gentlemen who have had experience in mechanical coal-cutting will come forward and generously give us the results of their experience. If, for instance, Mr. Lishman would send you a comparative statement of the working of the machines under discussion at the Hetton collieries how much light would be thrown upon the subject. It is well known that the Hetton Coal Company have had two of Mr. Firth's machines at work for five or six years, and two of Baird's for over twelve months, and lastly they have, I believe, within the last few weeks tried the Gillot and Copley machine in competition. Here, then, are data on which to base conclusions on which reliance may be placed. The Elemore Main coal is, I do not hesitate to say, as hard as any in England; the machines have competed on the same ground, and under the same circumstances, and I sincerely trust that Mr. Lishman will give us the particulars.

Then a few words in reply to Mr. Firth. I do not wish to push my analogy between the two machines and the steam-hammer and slotting machine *in extremitate*. My meaning was this, that as the slotting machine is better adapted to cutting grooves in iron, &c., with its steady powerful planing motion, than a chisel giving a series of violent blows, so I think that in a coal of a close and fibrous texture the slotting principle of the Gillott and Copley is a better application of power than the violent percussive motion of Mr. Firth's. But inasmuch as coal differs considerably from iron, I content myself with explaining my meaning, I leave the question to its practical solution. Then, as to the cost of the power. I find by experience that an air-compressing engine with an air cylinder 14 in. diameter \times 30 in. stroke, pressure of steam 45 lbs., will have to run about 60 strokes per minute to keep one Gillot and Copley machine going. The minimum pressure of air at the machine should not be less than 30 lbs. Now, it must be borne in mind that in calculating the speed of the machine for the purpose of estimating the cost of power, we must take the average speed when actually cutting at the face, as that is the only time when the air is consumed. Assuming, then, the figures given in my former letter—15 yards per hour when actually cutting—we have 120 yards cut in 8 hours, for which period we must charge the power. The fairness of this must be evident in all cases where the compressors are used for other purposes. I assume a 4-ft. seam, depth of cut 3 ft., and specific gravity of coal 1.25 ton per lineal yard, or 120 yards \times 1.25 = 150 tons.

Charges for power.

1 engineman at 6s. per day	£0 6 0
1 fireman at 5s. ditto	0 5 0
1 ton of coal at 7s. per ton	0 7 0
Stores and sundries	0 1 0
Total	£0 19 0

We have, therefore, 150 tons costing 19s. for power, or 1.25d.

From his questions I gather that Mr. Firth assumes that I am working my machines experimentally only. Such, however, is not the case, for although I gave the working results of only one machine, I have several others which work equally regularly, and of which an independent account is kept. Mr. Firth does not keep a detailed account of the working of his machines, but I find it useful to do so. Coal-cutting machines to work satisfactorily must, in my opinion, be grafted on to the system of working already in use at a colliery. I refer to the habits of the men, not of the method of working the coal. Thus, I found that my hewers were in the habit of paying 9d. per yard to other men for kirving, consequently I accept this, and retaining the original tonnage price, deduct 9d. per yard for every yard kirved by machinery. How, then, is it inexplicable that the hewer should make the wheel-hole for nothing? We only deduct what has been actually cut by the machine, and as I never saw a wheel-hole more than 2 yards long, it practically means that for machine purposes the face is 2 yards shorter than before. We have now 9d. per yard in hand to cover the cost of cutting, of this I pay 6d. per yard to the man who contracts to do the cutting, and for which he removes the machine from face to face, and does all other work, including road laying. This leaves us—

Charge for kirving..... 9d.
Paid to contractor..... 6d.
Estimated cost of power (*ante*)..... 1 1/2d.

Balance 1 1/2d.

per yard, or in a 4-ft seam 2d. per ton to cover capital, &c. With respect to length of face, I can only say that I get the longest faces I can with safety. I have faces nearly 300 yards long, I have others not much over 30. I think 100 yards is as long a face as will generally obtain, but it is entirely a matter of circumstance. I will only say that so far as my experience goes it is of infinitely more importance than the windways between adjoining faces should be shorter—say, 3 or 4 yards—than the distance between the different districts or levels. In the former case the men have to move the machine, on its own wheels, up a bad road in a position in which they cannot effectively utilise their strength; while in the other by mounting the machine on a tram and using a horse, it can be transported from district to district with no more trouble than an ordinary tub.

I have been induced, Mr. Editor, to offer these few remarks in the hope that others better qualified to do so may come forward and give us the benefit of their information. It is just in the minor details that we can help one another. If this is done, I for one entertain no doubts as to the ultimate success of mechanical coal-cutting in a *pecuniary sense*—a result which I have certainly never yet seen attained.

A MINING ENGINEER.

SIR.—Will you allow us to correct what we consider a typographical error in our report of the 15th inst. We are made to say that we work our coal cutting machine at from 50 lbs. to 55 lbs. pressure, &c. Now, our copy says from 30 lbs. to 35 lbs., and not 50 lbs. to 55 lbs.

JOHN PARKER, Manager,
JOHN TAIT, Underviewer.

New Market Collieries, Adwalton, near Leeds, May 25.

VANCOUVER COAL MINING AND LAND COMPANY.

SIR.—Your report of the proceedings of our meeting, as published in last week's Journal, contains that which appears to me an irreconcileable statement. We are told, on the one hand, that the Intercolonial Railway has been suspended or abandoned, and on the other hand, that there has been a great *furore* for our land at considerably enhanced prices. Our Chairman's statement, too, is not clear, at least to my mind, as it might have been—if the Dominion, as well as the Home Government, have committed themselves to the construction of the line and also to the route indicated, and that consequently our land is in demand (which I have always regarded

as an asset of increasing value), how comes it the scheme has been abandoned, or at any rate suspended?

Again, I am not quite clear as to the import of Mr. Wild's remarks, who appears to speak "as one having authority." Does he mean to imply that calls are "looming in the future," and in the immediate future too? or (as far as working capital is concerned), are we labouring under, to use Mr. Disraeli's words, "the ignobility of pecuniary embarrassment?" Mr. Wild says "it would be better to employ more capital in our investment;" pray, what does this mean? Calls, increase of capital, issue of debentures, preference shares, or what?—May 27.

A COUNTRY SHAREHOLDER.

THE NICKEL AND CHROME IRON MINES OF NEW CALEDONIA.

SIR.—As promised in my letter in the Supplement to last week's Journal, I beg to offer a few remarks on the difference between the New Caledonian nickel ore and the Riedwankite ore. In 1868 Hermann mentioned his discovery of a mineral, then new, found at Riedwankite in the Ural Mountains, and named Riedwankite, in the *Journal P. Chem.* (as recorded in the Q. I. S., April, 1868, p. 259), and which I am told is the same as *Riedwankite*, named in the Supplement to Dam's "Mineralogy," 5th edit., 1868, p. 803. If this is so, that mineral is not the same (as shown by its proportional constituents) as the New Caledonian mineral. A comparison of the results of analyses will show the differences, as follows:

Garnier's (New Caledonian) Mineral.		Liversidge.	Mean.
Sil.	48.90	5.212	5.256
Mag.	10.93	47.276	47.197
Nickel	0.46	23.960	24.010
Sulph. acid.	0.83	1.566	1.776
Iron and alumina	15.13	Alumina & ferrioxide	1.688
Water	17.73	Lime (O)	traces
		Magnes. (Mg O)	21.583
Total	96.400	Total	99.591

Riedwankite or *Riedwankite* (HERMANN).

Sil.	32.10
Al.	3.25
Iron prot.	12.15
Nick prot.	18.83
Mag.	11.50
Water	9.5
Mangan. prot.	trace
Sand	13.00
Total	99.83

Riedwankite was *new* in 1868, but Garnier found and reported the New Caledonian mineral before 1865. The Rev. W. B. Clarke called the New Caledonian mineral *new*, because it was *new* to science by analysis, and had not found its way into mineralogical treatises as a New Caledonian species, although Prof. Liversidge (Sydney University) reported several analyses of the mineral to the Chemical Society of London. The New Caledonian mineral is very closely related to one or two other minerals, and more especially to *alipite*, but in some respects it differs from it very decidedly, and Prof. Liversidge proposes that in consequence of such differences it should receive a distinctive name, although he has a great objection to making a multiplicity of species, or of giving different names to minerals which are often merely varieties of one another. Under all the circumstances he thinks it could not receive a better name than *noumeite*, after the town of Noumea, near which it is found, and from whence it is shipped, as it would be a great inconvenience to have to speak of the mineral by its chemical name—"hydrated-nickel-and-magnesium-silicate," or, according to Dr. Frankland's nomenclature—"trihydric dekanickel-magnesic octosilicate."

As special mention has been made by me to the Percy and Kelly, and the Grand Mount d'Or Mines, and lest any mistake should arise as to the percentage or the richness of the nickel ore taken from them, and thus unintentionally be the means of inducing the public to invest on the faith of the analyses previously published, I think it but right to publish the following chemical tests which were made in this country at my request.

No. 1. Samples taken by the sampler of Messrs. R. R. Kelly and Co., 59, Mark-lane, and assayed for them by Messrs. Johnson, Matthey, and Co., returned 2.50 metallic nickel.

No. 2. Ditto, ditto, returned 2.20 metallic nickel.

worked by driving levels, consequently independent of machinery for sinking and raising the ore to surface, or any interruption as regards water.—*Bristol, May 26.*

W. B. P.

FLAGSTAFF SILVER MINING COMPANY.

SIR.—The unexplained delay in announcing the result of Mr. Woodfield's inspection of our mine is once more beginning to awaken doubts—however unfounded—as to whether the provisional arrangement made at the recent meeting will, after all, be successfully carried out. I know through my own private channels of information that, as far as the mine itself is concerned, its position both as to present value and power of production far exceeds anything in its previous history, while most satisfactory progress has been made in absolutely necessary exploratory works—necessary to enable current returns to be economically made, and at the same time ensuring and establishing a successful future. It is this fact which makes the present pause the more perplexing, if nothing worse. It savours strongly—very strongly—of some big stock operation, emanating not, be it understood, from our respected representative, Mr. Woodfield, but from that source whence has sprung so many similar movements. The present depressed price of the shares and nominal decline in value is to show those who have carefully watched all the premonitory phases of their recurrent operations, evidence sufficient to be conclusive on the point, and it is not those shareholders who have upon previous occasions been led to sell their holdings at low prices (brought about by what is technically known as "a false market") who are now likely to be guilty of the same fatal error.

Shareholders, do not be again hoodwinked. You possess a most valuable mine—more valuable now than it has ever yet been. Retain your interest with unflinching tenacity, and this time secure to yourselves the resultant advantages of the rapid and important rise which is imminent in the market value of your stock. For once be just to yourselves—"Keep your eye upon your Chairman, and he will pull you through."

JONATHAN,
May 26.

THE BABB AND PACTOLUS MINING COMPANY.

SIR.—In an article which appeared in the Journal last week, headed "Mining on the Pacific Coast" (from our correspondent), I find a most unwarrantable statement in regard to the Pactolus Mine, located in California. Your correspondent questions my authority to act in the matter, and adds—"Knowing some of the proprietors of the Pactolus Mine, I waited on Mr. Garnett, the President, and learned from him and others interested in the mine that they had not authorised its being put on the market, or even of its being disposed of in any way." My answer is, the Editor of this Journal will assure his readers that I have this day shown him the instrument under which I have acted, and that the said paper is signed by "Louis A. Garnett, President; T. S. Brete, Secretary," with the seal of the Pactolus Gold Mining and Water Company, Smartsville, Yuba county, California, in raised letters at the left hand, opposite the said signatures. Neither prospectus has ever been advertised, or appeared either wholly or in part in any newspaper, and the number of either prospectus that has passed from the office does not exceed 300.

The statements to be proved in the last prospectus are printed in red, and are preceded by these words—"Subscriptions for the debentures will be received, subject to the verification of the following statements, by an agent to be appointed by the subscribers, whose expenses will be borne by the company." I shall most certainly endeavour to obtain redress for any injury myself or the owners may suffer from the unfounded statements coupled with my name in the article referred to.

JAMES LOUIS POND,
May 27.
Local Manager of the Marysville Gold Company (Limited).

[We very willingly certify that Mr. Pond has submitted to us all the necessary documents for proving the thorough inaccuracy of the statements of which he complains, and that the genuineness of the several seals and signatures to the contracts, affidavits, &c., is duly verified by the official attestation of the British Consul at San Francisco.—E. M. J.]

THE PATENTS FOR INVENTIONS BILL, 1875.

SIR.—The Bill introduced by the Lord Chancellor to amend the Patent Laws having been considered by the London patent agents, at several general meetings to which all of them were summoned (at which Mr. H. Gardner, of Messrs. Roberson, Brooman, and Co., presided), they have passed resolutions suggesting the following amendments, which, from the practical experience acquired in the exercise of their professional duties, they consider are essential for the better securing the protection of inventors' rights and the advantageous working of the patent laws.

1.—That, to ensure efficiency, it is desirable that one or more paid commissioners should be appointed, to be selected for their technical, scientific, and legal knowledge; before whom all matters and cases in respect of inventions should be heard and decided, subject to an appeal to the Lord Chancellor.

2.—That all patent agents be registered under such regulations as the commissioners shall make, and such be allowed to practice in all matters before such commissioner or commissioners.

3.—That the number of examiners and assistant examiners is inadequate, and that neither the referees for patents nor the duties proposed to be performed by them are necessary or desirable.

4.—That application may be made by the applicant lodging a provisional specification, as provided by the Act of 1852, which has been found to work well, and should be retained. That the final specification should be filed within six months from the date of application, the proposed examination being made after the filing of the complete or final specification.

5.—That notice of filing the complete or final specification be published, and that any person having an interest in opposing the grant may lodge notice of opposition with particulars of his objections within a prescribed time, the objections (if any), with particulars thereof, being referred to the commissioner or commissioners with the report of the examiners.

6.—That the filing of the complete or final specification be equivalent to notice to proceed; and that formal notice to proceed, if necessary for any reasons, be given at the same time. The patent shall be sealed within three months from the date of filing the final specification. That the provisional protection shall be for nine months.

7.—That giving power to the examiners to decide as to the utility, value, great importance, or frivolous character of an invention is not desirable. That the examiners shall report not only whether the specification is *prima facie* sufficient, but also whether it accords with the title and with the provisional specification.

8.—That is not desirable in any case to limit the duration of a patent to seven years but that on the contrary the duration of every patent should be for 21 years.

9.—That the examiner shall lay his report with application, specifications, and relative documents before the commissioner or commissioners, who shall consider the same, and shall hear the applicant, and any opponent, and then make public the application and specifications only.

10.—That all patents granted ought to remain in force irrespective of foreign patents. That a patent shall not be granted on the application of a foreign inventor, unless the applicant declares himself to be the first and true inventor, or his authorised representative, and no patent shall be granted in respect of a communication from abroad except from the true and first inventor.

11.—That there should be power to revoke a patent for the non-use thereof.

12.—That it is desirable to restrict the obligation to license to cases where the improvements are applicable to existing processes.

13.—That, in default of agreement, the terms between an inventor and the Crown, should be settled, not by the Treasury, as proposed, but by the same authority as shall fix the terms for a compulsory license.

14.—That it is not desirable to require the deposit of models in any case.

15.—That the rules when made should be sanctioned by Parliament before coming into operation.

16.—That it is desirable that all stamp duties required to be paid by inventors be very materially reduced, and that the entire stamp duties for the grant of letters patent should not exceed 10.

That a clause should be introduced providing for certain days of grace for payment of stamp duties being allowed on payment of moderate penalty.

Clement's Inn, Strand, May 27. C. GRAHAM CARTTAR,

Secretary, the London Patent Agents Committee.

MINING IN CORNWALL—THE MEETINGS.

SIR.—The reports and remarks on mine meetings in last week's Journal are worthy of more than passing notice, as they prove conclusively that things are not so bad as they seem. Although Providence Mine made a small loss of 90*l.* per month on the four months' working, yet a very casual observer will not fail to detect in the reports sure signs that the mine is gradually reviving itself, and a promise that it will resume its old position as a dividend-paying mine, affording employment to a large number of hands. From the printed report I observe that 74 men are employed on tuckwork and 37 on tribute, and, therefore, the mine is not being worked unfairly, is not having its "eyes picked out," or being "racked" to keep up returns and pay cost at this unusually severe depression. Perhaps the mine has been expanding too rapidly since it so suddenly contracted its works, but still it is doing wonderfully well.

Botallack still keeps alive. The expenditure is very great, and fortunately the receipts are greater. Here, too, more hands have been taken on. Carn Bras Mine has not been doing so well as one could wish, and the loss, real enough, in spite of "if's," must have surprised some of the shareholders. All will hail the new system of paying each three months' cost quarterly as a great improvement. Nothing surprises shareholders more than after making a bare enough profit for three quarters, to find themselves behind—far behind—in the fourth. Captain Teague's foresight in keeping a large balance on hand is shown here, and justified, in spite of the anxiety of the public to receive dividends of increased value. Captain Teague holds such a stake in the mines he manages that their interest is identical with his own, and his copartners have, therefore, naturally great confidence in his foresight and sagacity. Still, however, there is not that clearness in the system of accounts that one could wish.

Tinocroft still holds up its head. It is a very remarkable mine, unsurpassed in richness of mineral. South Crofty account was a surprise to many, and the mine seems at last to be about to justify the expectations indulged in two years ago, when people bought as high as 120*l.* The junction of the two lodes in the engine-shaft at the 200 is looked forward to with intense suspense, as it is the main feature in the working of the mine, which, like most mines of that district, has been both a lasting and paying concern. Cook's Kitchen seems to be falling back, but we believe the value of the mineral does not lessen itself, but that the present depression is solely owing to the general depression now so disastrously prevalent.

East Pool has again proved that it is a mine of the very first class, that no depression crushes it, no misfortune overpowers it, and now, invigorated by rendered new life, it has begun, even in times of disaster, to make profits worthy of better days. What riches have been yielded by these mines in this small mining neighbourhood! And yet even here we find poverty and riches lie side by side, mundic, whose very names are fabled, are contiguous to mines the working of which has been one series of losses.

The severity of the past (let us hope) depression is strikingly exemplified by the numerous dismantled engine-houses we see rearing their heads, like old watch-towers, old forgotten castles, black and grim with centuries of smoke. Whole districts are depopulated and ruined, rendered desert-like and barren by huge mounds of refuse, and dangerous by gaping pits and unfathomable shafts. Nowhere is this more strikingly seen than in the Gwennap district, where were once the famed United Mines, now deserted. Yet even these will probably, after many years, be re-worked, and with profit. So with very many others.

There seems to be an impression growing more and more general that the worst is past; that the cruel waters which have swept over mining, and desolated Cornwall, are on the subsidence, and that ere long everything will be revived. "Coming events cast their shadows before." Is this a sunlit shadow—a sure token of the bright sun that is chasing off clouds? Time will show us?

A CORNISHMAN.

VAN MINES.

SIR.—In printing my report of May 5 upon this mine, in the Journal of May 8, you have made a mistake by rendering the valuation of the stopes in the back of the 60 ft. level as 220*l.* per cubic fathom. Upon referring to the copy of that report I find that we have written it carefully—22*l.* 10*s.* per cubic fathom. My principal reason for publicly asking you to allow this to appear is in order to prevent "Observer" right in his calculations upon the yield of this mine, as there is a vast difference between 220*l.* 10*s.* and 22*l.* 10*s.* per cubic fathom.

Llanidloes, May 25. WM. WILLIAMS, Manager.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

THE OAKWELL COLLIERY COMPANY.

The adjourned general meeting of shareholders was held at the London Tavern, on Thursday,

MR. CORNELIUS WALFORD, F.S.S., in the chair.

The SECRETARY having read the notice convening the meeting, The CHAIRMAN said that since the last meeting the committee had devoted a great deal of time to the affairs of the company. One point on which the committee had expressed their opinion was that it might be desirable that some other of the shareholders should be selected for seats at the board than those who had been directors before. He thought that was very good proposal. There was really one vacancy at the board, because Mr. Thorpe was unwell, and had no desire to be re-elected. The Ipswich shareholders were a large body, and were desirous of having a representative at the board. He had resolved to place his resignation in the hands of the meeting, and that would give the meeting an opportunity of electing two directors, and that would complete the board.

Mr. Smythe, the retiring director, was then re-elected, and Mr. Wollaston was elected to a seat at the board.

Dr. KNOWLES said the committee had drawn up the following provisional report:—

Your committee have held three meetings, and investigated the affairs of the company as carefully as the limited time at their disposal permitted, in order to ascertain its true position, pursuant to the request of the meeting, held on the 12th inst., and have to report as follows:—The present financial position of the company, as nearly as can be ascertained from the books produced, is shown by the statement issued herewith. From this it will be seen that the liabilities exceed the assets by about 45*l.* 0*s.*, but it must be borne in mind that the colliery with Ellis's winze, would not interrupt the rod from Latchley, in the 60, so that Ellis's winze, the water charge being light, would become a convenient sump and drawing shaft. The sinking of the new shaft would have the high approval of Capt. Richards, who says that it should be sunk at once. Were this done I believe that the mine would be brought into a permanently paying state, for an almost indefinite number of hands could then be employed, and the quantity of mineral raised in accordance therewith. The cost of the new shaft sunk—say, 6 ft. long by 4 ft. wide, including that of skip-road, would be (say) about 750*l.* or 800*l.*, and I think that the work might be accomplished in two years.

Capt. Richards thought this shaft could be made in 18 months. If this shaft was commenced now it would be completed about the same time this communication was effected, when the mine could be fully and efficiently developed. Reckoning the arrears and the calls, the capital would be ample for developing the mine. With regard to the last paragraph in the report, he (the Chairman) was sorry he was unable to offer himself for re-election as director, having ceased to reside in London; this he was very sorry for, as he should have been glad to retain his position till the mine was in a dividend-paying condition. However, it was satisfactory to him before retiring from the board to receive such reassuring reports as to the value of the property. He then moved that the report and accounts be received and adopted.—Admiral STODDART seconded the proposition.

Capt. RICHARDS said it would be for the benefit of the company to sink the proposed shaft forthwith. It would cost about 800*l.*, and be accomplished in about 18 months.

Capt. LEAN said the shaft was absolutely necessary; it was indispensable for the company's interests and welfare. He believed any man who was a miner upon seeing that lode would say it would improve as depth was attained. An extension of the galleries was necessary, as the two present shafts were 200 fms. apart, and the ground hard and expensive. He reiterated his opinion as to the successful future of the mine.

The report and accounts were received and adopted.

A lengthened discussion ensued, during which a SHAREHOLDER announced that one of the retiring directors, Mr. Boldero, had died suddenly. Lord Bingham, under the circumstances, consented to be re-elected a director, and to remain in office until the necessary alterations in the Articles of Association, whereby Capt. Richards could be appointed to a seat at the board without remuneration as a director, the object being to reduce the London expenses.

The auditor was re-elected.

A vote of thanks to the Chairman and directors closed the proceedings.

DEVON GREAT CONSOLIDATED MINING COMPANY.

The half-yearly general meeting of shareholders was held at the offices, Gresham House, on Thursday,

MR. W. A. THOMAS in the chair.

Mr. ALLEN (the secretary) read the notice convening the meeting. The minutes of the last half-yearly meeting were read and confirmed, and the accounts (as previously circulated among the members) were taken as read.

The report of the directors was read, as follows:—

The directors of the Devon Great Consols Company (Limited) have convened this sixth half-yearly meeting for the adoption of the statement of accounts, and the estimated valuation of the liabilities and assets of the company, in conformity with the Articles of Association. The accounts are made out in the usual form, and exhibit, as certified by the auditors, a true and correct view of the affairs of the concern, which the directors regret are not so satisfactory as they could wish. The experimental explorations agreed upon by the lessor and his agents and the lessees have hitherto proved unproductive, entailing an absolute loss which no amount of rebate on dues will satisfy. On the other hand, the valuable discoveries of ore which have been made on the new south lode, which will, it is hoped, compensate for all loss hitherto sustained, and ultimately prove most profitable to the members. The manufacture of arsenic, considered independently of the unavoidable fixed expenses of the company, has proved to be profitable, as can be easily perceived by comparing the cost of the reduction works with the proceeds of the sales of that article, which, for the sake of convenience, are kept distinct from the other general expenses. The demand for it having been good the directors anticipated a much better price for next year's contract. The rebate on dues has been paid to the end of last year, the lessor's agents having been satisfied that the contemplated explorations have been carried on with adequate perseverance and energy. Capt. James Richards has, as usual at this half-yearly meeting, given a comprehensive report on the present state and future prospects of the mines, which, apart from the exploratory operations, cannot be considered otherwise than most satisfactory. The only applications for the office of directors are from Messrs. Thomas Morris, W. A. Thomas, J. Blackwell, and H. S. Morris, who offer themselves for re-election.

The CHAIRMAN said he was prepared to reply to any questions that might be put relative to the accounts.

Mr. PAGE did not know if there was any difficulty in the way of sending out the report of the directors, and also that of the captains, before the meeting took place. It was usual in other companies, and thereby shareholders could prepare themselves to make any remarks. He did not speak as a matter of complaint, but merely as a suggestion.

The CHAIRMAN said, as far as the report of the directors was concerned, it was a reiteration of the accounts. But as to the report of the agent, Capt. Richards was desirous of bringing down the information to the very latest moment; therefore, it was generally deferred to the meeting, and if the shareholders should wish it issued prior to the meeting they could not have the latest information.

Mr. PAGE said the report of the directors in the present instance appeared satisfactory, and it was most desirable that such information should have been in the possession of the shareholders before the meeting. He was sorry to find there was such a large amount of arrears of call; for a company of this character, consisting of proprietors of *bona fide* character, such a large amount should not be outstanding. He questioned whether it was not the provision of the directors to look into this question more closely.

The CHAIRMAN said the board had just been discussing this matter; the greater part of the arrears was due from the estate of a deceased member. Some difficulty had arisen in proving the will, and also in collecting the assets of the estate, which were ample for everything this company required of them. They had the assurance it

would be very shortly paid; interest would, of course, be charged, as authorised by the Articles of Association.

Mr. PAGE asked if it were considered the whole of the arrears were safe?

Mr. ALLEN said there was no reason to think otherwise.

Mr. PAGE asked whether there were good grounds for hoping there would be a better price for copper than there had been?

The CHAIRMAN did not know that they could complain of the smelters not having given them fair proportionate prices; taking into consideration the present increased expense of smelting, he could not say the smelters had not done the company tolerably good justice. There was a considerable difference between the value of copper in the ore and the smelted copper—the difference used to be something like 22s. per ton, depending upon the produce of the ores—poor ores required more fuel to smelt them than rich ones, consequently the difference would be greater than in those of a richer quality. It was difficult to say what copper would be. Unfortunately, copper was now produced in such abundance in different parts of the world, and such was the effect of telegrams and rapidity of communication, that no sooner good prices ruled than the market became flooded; therefore, it was impossible to venture any reliable opinion as to what would be the price, they were always hoping for better prices. He had before him a table showing the different prices realised for copper in the one—one sale they got 77s., when copper was selling here at 95s., which was a small difference; there was another sale, when there was a great difference, so that it was capricious and difficult to form an opinion.

Lord CLAUD HAMILTON asked upon what estimate the last returns had been based? He hoped upon a low level.—The CHAIRMAN said the sale had since taken place, and had resulted 95s. more than the amount estimated.

Mr. MORRIS then read the report of Capt. Richards, which referred to the considerable improvement that had taken place in Wheal Emma; the present reserves of copper were computed at 26,711 tons, and of arsenical muriate 20,000 tons.

Mr. PAGE said the able and exhaustive report just read corroborated the desirability of having it circulated before the meeting.

Mr. MORRIS said that could not be done if shareholders wished to have the information up to the latest period.

Mr. PAGE said the report was just such a one as they might expect from so able a man as Capt. Richards. It was pleasing to hear such an elaborate report, and also one so encouraging. It put one in mind of the olden times, when some points in the mine were worth 200s. per fathom.

Mr. MORRIS said at times the lode had been worth 500s., 600s., and 800s. per fm. Mr. PAGE asked if it were worth while to continue to lay out so much money in sinking the shaft for tin, with prospects so indefinite?—Mr. MORRIS said they were bound to do it in pursuance of the covenants of the lease.

Capt. RICHARDS in reply to a question, said that as yet nothing of any decided value had been met with at the shaft, nor did they expect any amount of tin until the shaft had been sunk another 40 fms. They were 20 fms. deeper than when he reported he did not expect anything of importance until the 60 had been reached. The character of the ground had considerably improved; they were now able to sink 8 fms. per month, instead of as hitherto, 3 ft. 6 in.

Mr. MORRIS said that at Dolcoath, Carn Brea, and some of the other large tin mines of Cornwall, tin was not obtained until a considerable depth had been reached—something like 250 fathoms—and some of those mines were now 340 fathoms deep. Therefore, there was some hope for their mine, more particularly the practical men from Cornwall had described the change of ground which had taken place to be precisely similar to that at Tincroft and other of the great tin mines.

Mr. PAGE enquired if the railway was still remunerative?

The CHAIRMAN said it was used only for the purpose of carrying ore from the Balford United Mines. They were not at liberty to use it for mercantile purposes.

Mr. G. TAYLOR asked if upon such a promising report a call was contemplated? The CHAIRMAN said much depended upon the sale of the ore. It must be evident to all who looked at the accounts that losses were incurred, and money must be found to meet them, but they were very sanguine, and doing all in their power to stave off the call, and he did not think it would be wanted just yet. If the ore should improve in quality and a better price be realised they would not want any call at all. They could say most conscientiously that the whole concern was conducted upon most economical principles, and everything done that possibly could be to reduce expenditure in the carrying out of a great concern of this kind.

Certificates from the company's engineers were submitted to the effect, that during the past year the machinery had been maintained in good working order and repair.

Upon the proposition of Mr. PAGE, seconded by Mr. FITZGERALD, the report and balance sheet were received and adopted.

Upon the proposition of Mr. CHATFIELD, seconded by Mr. G. TAYLOR, the sum of 50 guineas was placed at the disposal of the directors for the promotion of the education of the children of the miners employed at the Devon Great Consols Mine and other charities in Tavistock.

Upon the proposition of Mr. MORTON, seconded by Lord CLAUD HAMILTON, the retiring directors were unanimously re-elected, and the sum of 400 guineas was voted for their remuneration during the past year.

The CHAIRMAN, in acknowledging the vote said, they would continue as they had done for the last 30 years to work for the benefit of the company, for by so doing they would not only be working for themselves but also for their fellow-shareholders. They had had the pleasure of presenting most favourable results, and they only hoped the time would come again when they would be able to do as hitherto. (Hear, hear.)

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Capt. RICHARDS, in reply to a question, stated that in about four months the compulsory working at Wheal Maria would drop off, which would be a saving to the company of 250s. per month; and at Wheal Emma there were 46 fms. driving to complete the compulsory work, when they would reach an exceedingly promising lode.

Votes of thanks to the Chairman, directors, and officers of the company concluded the proceedings.

SOUTH AURORA MINING COMPANY.

At the adjourned general meeting, to be held on Wednesday next, the directors' report, balance-sheet, and accounts to Dec. 31 last will be submitted.

The directors believed in January that the properties then described would have been in operation, but from various uncontrollable causes the Gilbert and Chaudiere Gold Fields, and the Anguilla Phosphate Company are not at this date working. With reference to the first-named company the 30000, voted by the meeting was expended, and on the report of Mr. Egerton a further sum of 10000, for proving the value of the property was advanced on mortgage. Mr. Egerton now wants further funds, and the directors will ask for power to make further advances from time to time at their discretion. Only 500s. has been advanced to the Anguilla Phosphate Company on mortgage, and further proceedings are stayed pending compliance by vendors with the terms agreed upon.

Since Capt. Glanville's report on the Olneta and Lame Mines of Corsica, the companies have commenced operations and opened the mines, and the directors, after due deliberation, considered it advisable to have a further independent report on the property before incurring the large outlay necessary in developing this extensive mining property, embracing a superficial area of 30 square miles. Capt. John M. Trelease was selected to proceed to Corsica, and on his return he reported favourably, both verbally and in writing, upon the mines. The directors have since given him the appointment of mining engineer, and he has left for Corsica to take full charge of the mines. Capt. Trelease is satisfied that he can verify by practical working the reports he has made on the property. From samples of ore assayed by Messrs. Johnson and Matthey, the directors have a high opinion of the value of these properties. By the contract made by the directors the whole of the money expended, and to be expended, form a first charge upon the properties, and has to be repaid out of first profits.

As to the South Aurora mines and mills it is stated that since the completion of the contract with the Eberhardt and Aurora Company, in 1873, the mines have been unworked, and the mill idle, therefore your property in Nevada is unproductive; still it must be protested and insured, and by the laws of the United States the taxes of the States must be paid whether the property is worked or not. The late manager (Dr. Goodfellow) is at present rendering gratuitous services, but the expenses of taxes, insurance, and watchman upon the property must be met, and these charges, unfortunately, exceed 1000s. per annum. The directors will be glad to receive an expression of opinion on the part of the shareholders as to whether it would be desirable to expend any capital in the development of the property, or whether it would be better to endeavour to dispose in some way of the min-s and mill.

The summary of accounts of the company to Dec. 31 show a total of cash in London and Nevada and of investments and loan of 27,731s. 4s. 3d., showing a deficiency of 1110s. 16s. 6d. in the cash and assets of the company since the date of the January report. They possess this in addition to the mines, mill, diamond drills, 340 ft. worth of tailings, and bonus shares. The directors have great confidence in the future of the company. The shareholders must not forget the difficulties the directors have to encounter in endeavouring to make such arrangements with the small capital at their command, so as to pay a dividend on the enormous capital of the company; and it is only by a judicious employment of their funds, and not by an absolute investment, that this object can be effected. The amount of bonus acquired during the year is 97,500s., in fully paid-up shares, and if the representations as to the value of the properties are realised, there can be little doubt the policy inaugurated is one which will best conduce to the welfare of the company.

*For remainder of Meetings see to-day's Journal.

NEW USE FOR TIN.—The following is M. Heeren's process for giving iron wire the appearance of silver. This is done by a thin film of tin. The iron wire is first placed in hydrochloric acid, in which is suspended a piece of zinc. It is afterwards placed in contact with a strip of zinc in a bath of two parts tartaric acid dissolved in 100 parts of water, to which is added three parts of tin, salt, and three parts of soda. The wire should remain about two hours in this bath, and then removed, and made bright for polishing, or drawing through a polished iron. By this galvanic method of tinning, wire which has been wound in a spiral, or iron of other shape, can be made quite white, which is an advantage over most other methods, where the wire is tinned in the fire and then drawn through a drawing plate.

DRAIN PIPES.—Mr. D. OPPENHEIMER, of Watling-street, has patented (for H. Hirsch, of New York) some improvements in the manufacture of drain pipes and other pipes and articles of plastic or mouldable materials, and in the production of materials or compositions for the same, and in apparatus employed for the said purposes. Sand or other earthy matter is agitated in a trough warmed by waste heat from numerous fire-places in a furnace. Over each fire-place is a caldron or vessel into which the contents of the trough are discharged, and in which they are mixed by means of agitators with cementing and other ingredients. A composition is described consisting of sand, clay, asphalt, and resin, with sulphur to harden the mass. A supplementary warming vessel may be used, being heated by the smoke flue. Limestone, marble, or carbonates of lime are added to other ingredients. The combination of earthy and resinous matters is effected by mechanical agitators at a temperature above that at which the fluid condition is induced, and the mass is allowed nearly to cool down to setting temperature for moulding. Sand, clay, and limestone are taken dry and heated and mixed and discharged into a lower mixer. Over the mass melted resin is poured, being drawn off from the lower part of its reservoir, so as to separate it from its oil and

lighter portions. A moulding apparatus is described, in which zinc is used at parts in which the plastic material comes in contact with metal, to prevent undue adhesion. Zinc moulding cylinders, interrupted in their peripheral continuity, are described with maintaining, fastening, and joint arrangements, and with contrivances for compensating for the contraction of the plastic material. Removable blocks or struts, turning links, and V groove and feather closures are used. A conical cap guides the plastic material into the moulds. A weighted plunger or follower condenses it.

IMPROVEMENTS IN PUMPS.—The invention of Messrs. EVANS and Sons, hydraulic engineers, of Culwell Foundry, Wolverhampton, refers to such pumps as work with a bucket, piston, or plunger, and have the length of the stroke regulated by a crank or equivalent forming part of or fixed to a revolving shaft. Firstly, the invention actuates a peculiar form of piston valve from an eccentric or equivalent on the revolving shaft. Secondly, the inventor actuates pump valves from the same eccentric or equivalent as is used to actuate the steam valve, or in the case of two pumps working opposite to each other he actuates the valves for both pumps from the same eccentric or equivalent on the revolving shaft. Thirdly, the inventor reverses the action of pumps having piston or slide valves so that the suction becomes the delivery and the delivery the suction. He effects this by reversing the revolving shaft, preferably by means of a separate loose eccentric or equivalent on the revolving shaft actuating the steam valve. Fourthly, the inventor starts pumps by using a loose eccentric and hand wheel for actuating the valves of both engine and pump.

MINING IN WESTPHALIA.

The mineral riches of Rhenish Prussia and Westphalia have been so long known to English miners that it is surprising those provinces have hitherto received so little attention from British capitalists, more especially as the majority of the mines at work have been remunerative to those engaged in developing them, owing to the cheapness of labour and skill of the workmen, although the amount of energy displayed has been by no means great. For some years past the title of the Westphalian Silver-Lead Mining Company has appeared in the *Mining Journal* Share List, yet but little has been heard of the undertaking beyond the announcement of dividends from time to time, and, beyond the fact that each 20s. share has earned 54s. in dividends, few even now know anything of the company. It is now proposed, as will have been seen from the prospectus in last week's Journal, to extend the operations, which have hitherto been very limited—there were only 500 shares—and carried on with very inadequate machinery. The Engelbert, which is the Westphalian Company's chief mine, has averaged 11,000s. per annum profit for the past three years, and the Friedrich der Grosse, belonging to the same company, is now in a promising condition, whilst there is a third mine, the Phillipus, which is an old working not yet cleared out. It is proposed to amalgamate these mines with some others in the same region, and work the whole by a company—the West Prussian Mining Company—with a capital of £10,000, in shares of 10s. each. The Heidberg Mine is very extensive, and admittedly open to all who looked at the accounts that losses were incurred, and money must be found to meet them, but they were very sanguine, and doing all in their power to stave off the call, and he did not think it would be wanted just yet. If the ore should improve in quality and a better price be realised they would not want any call at all. They could say most conscientiously that the whole concern was conducted upon most economical principles, and everything done that possibly could be to reduce expenditure in the carrying out of a great concern of this kind.

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with new ones, and substituting two Piltz blast-furnaces, such as are in use at Freiberg and in the United States, for the three antiquated low-shaft furnaces now at the works. With these and a few minor alterations he considers the works could be made capable of smelting 500 or more tons of lead ore per month. In conclusion, he states that he feels great confidence in the future of the properties as a whole, and fully believes that under judicious management it cannot other than prove a sound and remunerative undertaking.

THE QUEENSLAND TIN FIELD.

If wealth will not come to us it is sometimes, as an energetic practical German miner once said, worth while to seek for wealth, since Mr. Wohlstand cannot always keep in the darkness when we try to pull him out; and just as this German succeeded in realising a fortune in a couple of years by expending a few thousands upon a mining property which the English public declined to purchase, so it would appear from the prospects of the Queensland tin field that Mr. Wohlstand (Prosperity) is waiting with open arms to receive those who are inclined to spend some part of their capital and energy on the development of the mineral resources of that favoured province. A glance at Mr. Daintree's map of Queensland, showing the mineral areas, will suffice to show that not only is there a considerable quantity of gold scattered over the colony, but also that the very trifling efforts at development which have yet been made have sufficed to prove the existence of an abundance of coal of both palaeozoic and mesozoic age, and of copper and tin also. Queensland may be divided into three natural districts—the East Coast or Pacific, the Carpentaria, and the Western Interior, all of which give great promise of becoming important mineral countries. The principal rivers on the Pacific slope are the Brisbane, Mary, Burnett, Fitzroy, &c.; and in addition to much tropical and semi-tropical produce being profitably grown there, it is in the Pacific district that all the chief centres of gold and copper mining are included, and that manufactures have been commenced. In Carpentaria the principal rivers are the Mitchell, Gilbert, Norman, Flinders, and Albert. Two squatting stations only are situated on the head waters of the Lynd branch of the Mitchell; but a late exploration of the Mitchell and its tributaries, the Walsh, Palmer, &c., has resulted in the discovery of considerable areas of mineral country, of which the Palmer gold field is the centre, and a large population is being attracted there in consequence. A large extent of mineral country has been for some time worked at the head of the Gilbert, and a few squatting stations have been taken up in the neighbourhood of the mines. No mines have yet been discovered on the River Norman. The main branch of the Flinders traverses fine open chalk-marl downs, on which cattle are found to thrive well, and squatting stations exist all along its course; its western branches, notably the Cloncurry, drain a portion of the McKinlay range, and are likely to become important from the gold and copper ores found on their banks.

The Western Interior includes all that portion of Queensland lying to the west of the main dividing range, and south of the Gulf watershed. Of all the Murray affluents the Condamine is the most important, as on its tributaries are situated the Darling Downs. Within the last two years the previously-supposed worthless country lying immediately south of the Downs has been shown to be of great value from the large deposits of tin found in the valley of the Severn river. When it is considered that a coal formation, with several included coal seams, underlies these rich agricultural Downs, it will be seen that all the elements for the support of large pastoral, agricultural, mining, and industrial population are here present. The country drained by the Weir, Moonie, Warrego, and Paroo are essentially pastoral districts. The two latter are equally noted for their "salt bush" plains, and for the cattle reared on them. It will be readily understood, then, that of the three divisions mentioned the Pacific or East Coast, and the Darling Downs portion of the Western, are the two districts in which the immigrant will take the most general interest, as they combine agricultural, pastoral, and mining resources, with all that is needful for the successful prosecution of manufacturing industry in the future.

The beautiful collection of minerals and other products of Queensland, exhibited at South Kensington, and attentively examined by large numbers on Tuesday evening on the occasion of the Convocation of the President of the Institution of Civil Engineers, can leave no doubt that there is a great mining and industrial future for the country, one mass of malachite there shown being sufficient to make a Cornish miner envy them; but the present object is to describe the tin field. The stanniferous area includes a tract of granite country, the principal town of which is Stanthorpe, about a day and a half's journey from Brisbane; and Mr. Walter C. Hume, the Commissioner for Mineral Lands, has given a very interesting account of it. As both stream and lode tin have been found in granite, only a few remarks upon the Plutonic rocks in the locality are given. Several specimens are shown representing the average quality of granite throughout the district, but Mr. Hume often finds that in an area of only 300 acres several different descriptions may be found, coarse and fine grained, reddish, white, grey and blue, all existing within this small area; and not in the form of dykes, but in shapeless masses or areas of from one to several acres. In many places irregular masses of large crystals of felspar are met with, generally rose-coloured. The causes that have led to this he has tried to investigate, but without success, and can only submit that different rates of cooling, influencing course crystallisation, may account for it.

About the heads of Accommodation Creek and the range forming the boundary of the colony in that locality, a fine-grained dark-coloured rock is predominant, and is again met with at Tenterfield. Considerable difference exists as to liability to decomposition, the fine-grained varieties being the most refractory; in stream workings the bed-rock is often decomposed to a depth of several feet, assuming a pale green or blue colour, due, doubtless to the presence of iron.

In several places a white clay has been found, but whether it approaches the true kaolin has not yet been ascertained; it makes very refractory crucibles with calcined and ground quartz, the chief defect being that the paste is short. Micaceous granite has been found in limited quantities, generally associated with stanniferous veins. In only one locality—a little west of Ballandean Head Station—have trap dykes been found intersecting granite, and that only on two occasions; they were very thin, and their strike was north-east. In many places elvan dykes are found, varying from a few inches to several feet in thickness, their strike being from east-north-east to north east. The country on the Severn, about 7 miles below Stanthorpe, is intersected by more dykes of this description than any other part of the district. Only two or three granite dykes have been found, they coincide in direction with the elvans. None of the dykes appear to be of any length, but it is difficult to speak positively, as it is not easy to get good exposures. The granite is intersected by divisional or joint planes, which invariably bear north-east and south-west; this feature is more marked in some localities than in others.

Mr. Hume's investigations lead him to the conclusion that no lodes, in the Cornish sense of the term, have been formed at all, the appropriate words being strings or veins. These have been discovered at Killmister Lode Creek, Mount Maclay, and the Red Rock, their surface indications being lines of white or grey quartz, the hammer revealing crystals of tin ore, together with wolfram and molybdenite, in some cases the wolfram being very abundant. At Killmister a shaft 65 feet deep has been sunk on a vertical quartz vein, bearing about east 20° north, the width 2 ft. The country was very hard fine-grained granite, and the tin was found in the quartz in a string never more than a few inches thick,

north-east, was sunk by Messrs. Love and Moffat, a little east of Lode Creek. For 40 ft. the vein was vertical, then had an inclination of 45° to the south-east, with a defined hanging-wall. It is, however, doubtful whether this may not be a joint or a fault, an assumption strengthened by the fact that some of the cement and clay in contact with it was striated and polished, as if by a downward movement of the so-called wall. Nothing on the surface, however, indicates any perceptible slip. The actual tin was contained in a string of not more than 2 or 3 in. wide, being associated with wolfram. The country was hard blue granite, and in the vein itself the quartz in the lower part of the shaft was associated with a cement and fine-grained micaeous granite. The Mount Maclay Company sunk a shaft near Kettle Swamp, about 1½ miles from Stanthorpe, to a depth of 60 ft. on a quartz vein bearing north-east, down the centre of which ran a narrow string containing much wolfram and a little tin ore.

The Red Rock exhibits more promising indications than any other locality. On a gully running north-westerly into the Severn river, and in slate country, at an elevation of 3000 ft. above the sea, an irregular patch of granite occurs, which appears to have been intruded through the overlying metamorphic rocks, the result being a chasm of between 200 and 300 ft. deep, with slate cliffs on its north-east and granite ones on its south-west sides. At every few yards on the surface of the latter rock, particularly on the face of the cliff, stanniferous quartz veins can be seen, the widths varying from 1 in. to 18 in., and the strike being about north-east. So far as one can judge they all appear to be nearly vertical. In nearly every vein crystals of ore can be distinguished at the surface without disturbing them with the hammer, and no such show exists in any other part of the district. He is not aware that these veins penetrate the slate; this would probably have been discovered owing to the good exposure in the cliff. The upper workings consist of two cross-cuts or trenches about 14 ft. deep, intersecting tin-bearing veins 18 in. thick, containing strings of ore 2 in. or 3 in. wide, the country being a fine-grained quartzose granite, with sometimes micaeous granite. About a mile down the gully, and 650 ft. vertical below, Mr. Smith has sunk 15 ft. on a quartz vein. He states the "lode" to be 8 ft. wide, but Mr. Hume could see nothing to justify it, as the country changes so imperceptibly to the quartz in contact with the tin-bearing vein that it is hardly possible to define its limits. A few chains from Smith's shaft, a break in a small precipice or cliff lays bare a stanniferous vein running parallel to its face, which merits notice. A shot having been put in disclosed that the country was fine-grained granite of a reddish colour; but there was no quartz encasing the tin-stone, as is usual, that occurred in crystals on both sides of the vein, which was not more than 2 or 3 in. wide. The space between the points of the crystals was not filled with quartz, as is usual, but with coarse-grained granite, a circumstance he has never observed before. He here directs attention to what appears to be a peculiarity in all their lode tin. In all the cases he has mentioned quartz veins or reefs of greater or less breadth exist, throughout which tin is not generally disseminated as in other tin-producing countries, but invariably found in small strings or veins of from 1 in. to 3 or 4 in. thick. No defined walls bounding the quartz or flookan are usually found, which, as he has before remarked, much enhances the cost of working.

As to the probability of veins becoming larger, or a series of parallel ones converging at increased depths, Mr. Hume is driven to the belief that such will be found not to be the case; not so much on account of their present experience pointing that way, for that is limited so far as workings are concerned, but because, in what he considers he is justified in believing to be the same series at the Red Rock, he finds that some veins, which are 630 ft. below others, are no larger. Also, that in the locality where the richest stream tin is found no veins exist which on the surface yield any appreciable ore. This is coupled with the fact that on the main range forming the watershed of the richest creeks a very large quantity of broken fragments of stanniferous quartz veins is found on the surface, coming it would appear from rocks long since decomposed and washed away. Non-stanniferous quartz veins are of common occurrence, in direction being from north-east to east 20° north, and in thickness varying from 1 in. to several feet. As rule the colour is white. Commencing at the Red Rock and Killmister, there is a series of parallel veins running north-easterly through the whole of the granite to the boundary of the colony, where they appear to intersect the main range at the heads of Sugar Loaf Creek, and he submits that this series taken as a whole, and embracing, as it does, all tin bearing veins, may be looked upon as a near approach to what may be termed the main lode of the district.

The subject of how long the present field will continue to yield tin must, Mr. Hume continues, be approached with great caution. When stream workings were first commenced, in June, 1872, it was imagined that only the creek beds contained tin, that when they were worked out no more would be obtained, and short-sighted persons prophesied the speedy failing of the supply. But it has now been demonstrated that not only does it exist in the actual channels or beds of creeks, but far up their banks; in one case, that of the Brisbane Company, extending back from Quartz Pot Creek, a distance of 30 chains. In seven different places "surfacing" is now being carried on successfully, and it is impossible to say where in future it may not be extended to, as the most unpromising looking localities often give large yields. As a rule, the depth of surfacing works to the bed rock does not exceed 6 or 8 ft.—often not more than 2 or 3 ft. Tin is in some cases found from grass down, in others existing in the usual gravelly drift on the bottom. The fact of unequal distribution applies also to the beds of creeks, where the surface affords no indication whatever of the wash dirt underneath, the deposition of which appears to be entirely governed by the character of the bed-rock, rendering it utterly impossible to estimate what tin may be raised from any given lengths of creeks. Many selections remain unworked on this account, their owners believing that, because on one hasty prospecting no tin was found, none existed. The fact was that they had hit on a barren spot. Taking into consideration that most of the large stream workings will last another year, that many portions of creeks have not been properly tested, but will, in all probability, be worked when the richer ones fail, that it is certain large areas of surfacing only await being worked, that it is not demonstrated tin may not by the use of capital be extracted from lodes, Mr. Hume considers he is 'justified' in assuming that this field will last for many years. But this conclusion depends on tin not falling much lower in price than it is at present, which in Stanthorpe is 4d. per lb. If it fall below 4d. then most of the works will have to close; as, with a few favoured exceptions, mining proprietors cannot raise it with a profit at that price.

The greater part of the tin raised has come out of creek beds, from shallow workings averaging 10 ft. deep, the deepest never exceeding 25 ft. Wash dirt is distributed apparently in the most capricious manner, being what is locally termed "patchy." The thickness of the deposits varies from 1 in. to 5 ft. or 6 ft., averaging 1½ ft. A peculiarity sometimes met with is that in beds of drift horizontal layers of pure ore exist, about 1 in. thick, at intervals of 1 ft. or more, leading to the inference that it was not brought gradually down to the creek from its matrix, but at certain intervals, perhaps by heavy floods. Present appearances lead to the inference that the sources of our stanniferous tin were lodes, or more probably strings, existing in granite at a geological period when its surface was much higher above the sea level than at present; and which strings were laid bare, broken up, and gradually, or at intervals, carried down side gullies into creeks on its decomposition. That this accords with facts, is shown by mention of the main range at the head of Lode Creek, where, on the extreme summit, 3200 ft. above the sea, quantities of fragments of tin-bearing veins may be found on the surface; and, on washing the surface soil, it is found rich in crystals of tin, quite perfect and unabraded, proving that they have not travelled; in fact, they could not have done so, or they must have descended 500 ft. to the creeks below. The line dividing the granite to the east, and the slaty rocks to the west, is clear and well-defined.

Copper has been found in slate at Pikedale Head Station. It exists in a vein or lode apparently about 18 in. thick, which bears about south-east and north-west. On the surface copper pyrites and impure black oxide are found, and, on sinking a few feet, red oxide,

grey sulphide, and blue carbonate. There is reason to think this lode may extend a distance of three miles, it being first found at the head station, then about that distance north-west nearly in the line of strike. At Treverton Creek, in the same rocks, near Warrow Head station, several veins have been discovered, their dimensions as yet uncertain—strike easterly and westerly. Messrs. Lewis and Barton have raised several tons of ore, corresponding with that found at Pikedale, which on smelting gave over 20 per cent. of metal. So little has been done in copper mining that it is hardly safe to give any opinion on the subject. All that can be said at present is that the indications, so far as the workings have gone, are favourable. Pikedale is 50, and Treverton Creek 70, miles from a railway station, the roads passing over broken country. Timber for mining is good and plentiful. In several places limestone is met with in the slate; near the Red Rock occurring in dykes bearing north-east, apparently about 2 ft. thick; at Killmister in beds not far from the junction of the granite, and in close proximity to ironstone; near Glenlyon also in beds, through some of which caves extend for several hundred yards. The rock is in all cases highly crystalline, and appears to contain much silica. Near the head of Treverton Creek a dyke of calc spar exists, which appears to be about 3 ft. thick, and is said to extend north-westerly about five miles.

Reviewing generally the whole subject, Mr. Hume points out that at the commencement of the field much tin was lost, not in sluicing, but by persons managing claims not laying out workings to advantage, much payable ground being overlooked. In the first six months of 1873 they raised 2114 tons of ore, which realised at the mines 65/- per ton. In the first four months and a half of 1874 they raised 2000 tons, and when it is stated that the number of men employed in the latter period is about 25 per cent. less than in the former, that the price realised was only 44/- per ton, that the profits in both cases were the same, it is clear that increased economy must have been exercised in raising the ore. Arguing, therefore, from past experience, Mr. Hume thinks it possible that tin may be raised at a profit at even 3½d. per lb. This, however, will be the work of time. At present, in the great majority of cases, it would not pay under 4d. He considers that much advantage would result to all parties concerned were the ore melted on the ground, instead of in Brisbane, New South Wales, or England; a saving of 30 per cent. on the carriage would be effected, and the evils of the present pernicious system of combinations among outside smelters avoided. The question then arises whether it is possible to do so advantageously with materials procurable in the locality. Some of the granite forms good building stone for the bases of furnaces and chimneys. Lime is to be obtained within 14 miles of Stanthorpe. White clay exists within 4 miles of the same place, and appears to possess the quality of standing heat. It has been used in the construction of a smelting-furnace by the Mount Maclay Company (who have the merit of being the pioneer smelters). But whether it will come up to expectation yet remains to be proved. His own investigations, made by subjecting mixtures of it with other more plastic clays to intense heats in a small blast-furnace, lead him to suppose a good local fire-brick may yet be made. It is yet a matter of doubt if materials capable of forming the bottoms of furnaces can be produced in the neighbourhood. The nearest coal is on Farm Creek, Canning Downs, 30 miles distant. The predominant timber on the granite, and which must be used for smelting at present, is stringy bark, the worst fire-wood for ordinary purposes possible. It, however, burns into very good charcoal. It is to be feared the local limestone contains too much silica to be used as a flux. All these points, however, will be settled by the result achieved at the Mount Maclay Works, and by Mr. Ransome, who is also erecting smelting works in Stanthorpe.

It appears evident that in Mr. Hume the Queensland Government do not possess an over sanguine Commissioner of Mineral Lands, so that full reliance will be placed upon his statements by those in Europe who may take interest in the colony, and there certainly seems to be full justification for his conclusion that, taking into consideration the present condition of the field, and that they have tin lands to last them for several years, a large portion of which, under highly favourable conditions, is open under license to the working man—that copper exists in a workable form in great quantity—that there is every prospect of their being able to smelt the whole of their tin on the ground—that agricultural land exists in quantity sufficient to raise all produce required in the district—that building materials abound—that the fire-brick and pottery industries are likely to be established—it may be predicted that there is a prosperous future for the Queensland tin fields.

FOREIGN MINING AND METALLURGY.

No improvement can be reported at present in the French iron trade. The situation remains, in fact, much the same, and prices have not experienced any appreciable fluctuation. Some of the French metallurgical centres exhibit, nevertheless, a certain activity. Contracts are about to be let at Toul for the supply of the rails required for the construction of the Fort de Lagney tramway. Pig continues to be quoted in the Meurthe-et-Moselle at 21, 17s. 6d. per ton. A quarterly meeting of the forgemasters of the Franche-Comté district has just taken place at Besançon; no great amount of business was done, every one appearing rather disposed to sell than to buy. The Parisian iron trade has ruled quiet; merchants' iron has been sustained at 8/- 16s. per ton, and plates at 11/- 12s. per ton. In the Haute-Marne charcoal-made pig has been a good deal neglected; this is easily explained, having regard to the considerable difference observable in the price of this product, as compared with coke-made pig. Plates and chain iron have been in some request in the Haute-Marne. In the Nord the state of affairs is less prosperous. Heavy plates are sold at 10/- 12s. per ton, and No. 2 merchants' iron has made 8/- 8s. per ton; upon the whole, there have been few transactions, the demand having been weak, and of no great importance. A return has appeared with reference to boiler explosions in France. The return does not extend beyond 1868; in that year there were 24 explosions, which caused the deaths of 31 persons, and inflicted injuries on 33 others. Of the 24 explosions 19 are attributed to negligence, or want of proper inspection.

The Paris copper market has remained without animation, and the amount of business passing has been almost nil. At Havre, Chilian in bars has made 86/-; ditto ordinary descriptions, 85/- ditto in ingots, 88/-; English tough cake, 88/-; and pure Corocoro minerals, 86/- per ton. There has been little business passing in Chilian at Havre; prices have ruled comparatively feeble. Copper has been rather quiet at Marseilles. Business in copper in Germany has also been dull; the Hamburg market has been weak. There has been no great amount of business passing in tin upon the Dutch markets. Disposable Banca has been quoted at 50½ fls. to 50½ fls., and Billiton at 47½ fls. The Paris tin market has continued weak. Banca, delivered at Havre or Paris, has made 93/- 12s.; Straits ditto, 88/-; and English, delivered at Havre or Rouen, 90/- per ton. The German tin markets have exhibited no great animation. Lead has been further tending upwards at Paris. French lead, delivered at Paris, has made 22/- 12s.; and Spanish, delivered at Havre, 22/- 4s. per ton. Stolberg and Eschweiler have been quoted at Rotterdam at 13/- fls. per cwt., and German of various marks at 13/- fls. The German lead markets have been generally rather firmer. There has been a further advance in zinc at Paris; Silesian, delivered at Havre, has made 25/- 4s. per ton. Other good marks, delivered at Havre, have made 24/- 16s. per ton; ditto, delivered at Paris, 24/- 12s. per ton. In Germany holders of zinc have somewhat raised their pretensions.

The fall which has been for some time impending in the French coal trade is becoming every day more and more decided. Coal-owners offer an energetic resistance to any reduction in quotations, but, on the other hand, buyers are equally tenacious in their ideas, and they are waiting patiently for their realisation. They have very good reasons for adopting this course. The coal markets are everywhere choked up and overdone, and coalowners are reducing their extraction in the hope of maintaining high rates; this latter remark applies to Belgian mines as well as to French mines. Germany is diverting more and more into Belgium the surplus extraction of the Ruhr basin, and English coal is now expected to flow

more freely into France, and so to assist in reducing coal quotations in that country. At a recent sitting of the St. Etienne Mineral Industry Society there was a long discussion as to the advantages attending the employment of steel wire cables, and their great superiority over cables of vegetable fibre or iron wire. An official decree which has just appeared limits the daily employment of boys of from 12 years to 16 years of age in mines to eight hours; the decree also provides that this period of eight hours of daily labour shall be divided by an interval of one hour; it further prohibits the employment of boys of the ages named in painful or dangerous occupations. The Anzin Mines Company is a remarkably flourishing undertaking. There are only 288 shares in the company, and the last dividend paid upon these shares was 5200/- The annual extraction exceeds 2,200,000 tons, and the company is said to have a reserve fund of 1,600,000.

There is little fresh to report in the Belgian iron trade, but orders for rails are said to be becoming more numerous, and there is some anticipation that contracts of some little importance will be concluded. Some transactions are also reported for railway plant and locomotives. A contract for 100 goods trucks for the Belgian State Railways has been secured by the Belgian Colliery and Metallurgical Company at what is regarded as the low rate of 80/- 5s. 9d. per truck. Nine competitors endeavoured to secure this contract; this will afford some idea of the pressing necessities of Belgian industry just at present. Iron quotations remain feeble, and without variation. The Metallurgical Congress, which has just held its sittings at St. Petersburg, asked for the imposition of protective duties to check the importation of foreign machinery and metals into Russia, and to increase the prices of native products. It is, however, extremely doubtful whether the Czar's advisers will accede to this request, which is opposed to the economic ideas now generally current in Europe. The workshops and boiler works of M.M. Alexander Libotte and Co., at Lodelinsart, have just been transferred to the Lodelinsart Workshops, Foundries, and Boilerworks Company. M. Libotte will be the managing director of the new company. The administration of the Belgian State lines has invited tenders, to be delivered June 2, for the repair of 110 coal wagons; this step marks a change in the system of maintenance previously adopted upon the system.

As regards the Belgian coal trade, it may be observed that, in consequence of an understanding among themselves, the Charleroi coal-owners maintain their prices at a higher level than those current in the Liège basin, so that this latter basin might now advantageously sell its products to the clients of its competitors in the Hainaut. We understand that some rather important contracts for coal have been recently concluded in Belgium for private industrialists, at rates slightly below those solicited from the Belgian Government at recent adjudication. The position of the Belgian collieries is relatively good, without being brilliant; the prices obtained are still remunerative, but order-books are not too well filled. In Germany coal quotations continue to fall; this remark applies especially to Westphalia. The Belle-et-Bonne Colliery Company, at Fleno (Jemmapes), has declared a dividend of 3/- 12s. per share for the second half of 1874. The Pont de Loup-Sud Colliery Company has declared a dividend for 1874 at the rate of 2/- 16s. per share.

PLUMMET LAMP FOR SURVEYING IN MINES.

An ingenious lamp for the use of mine surveyors has been designed by Mr. Heller (of Heller and Brightly), of Philadelphia, and was described in a paper read before the American Institute of Mining Engineers at the St. Louis meeting. The improved lamp can be used either with or without the safety apparatus, according as fire-damp may or may not be present. The safety apparatus resembles to a certain extent that of the Mueseler lamp. It consists of a ring and plate united by four rods. The plate has a cylindrical hole in the middle, and four apertures distributed radially around it. In the central cylindrical hole is fitted a conical brass chimney, which projects below the plate and is fastened thereto, being kept vertical by four wire braces, or stays, which are soldered to the top of the chimney and to the outer edge of the plate. The top of the chimney terminates in an inverted frustum of a cone, which is made hollow, and is drilled full of small holes. The inside is lined with one thickness of wire gauze. On the upper part of the cone is screwed a brass cap, composed mainly of a brass ring and wire gauze; the smoke, &c., pass out through the latter. This cap must be cleaned from time to time, depending upon how much the lamp is used, and how much it smokes. It is as well to carry an extra cap in the pocket, which can be put on when the dirty one is taken off. An easy way to clean the cap is to allow a jet of steam to blow through it. The four radial apertures in the plate are also covered by two thicknesses of wire gauze. Between the top of the plumb-bob and the bottom of the plate, and inside of the four vertical wires, is inserted a cylinder of glass. When the safety apparatus is to be used the compensating ring is removed from the ring and placed upon the plate, which has two conical holes corresponding to those in the ring; the ring is unscrewed from the top of the plumb-bob, and another ring is screwed on in its place with the glass cylinder on top of the plumb-bob. As the second ring is screwed up the glass cylinder is clamped between the plumb-bob and the plate, making nearly an air-tight joint; the lamp having been lighted before the safety apparatus was screwed on, is now ready for use. The air passes down through the four radial orifices in the plate, which are covered with two thicknesses of wire gauze, is heated by the flame and rises through the chimney passing out through the wire gauze top. The glass is quite thick and well annealed. It has allowed the lamp to burn nearly an hour, until the glass was quite hot, and then thrown cold water upon it without producing any effect whatever on the glass. The best kerosene (as high a test as possible) should be used in the lamp, as the latter gets warm. The top of the wire gauze covering of the chimney becomes more or less clogged with lamp-black, which can be removed from time to time with a fine brush.

THE PROPERTIES OF GUNCOTTON.—Mr. J. Spiller, late Assistant Chemist to the War Department, writing from the Scientific Club in reference to the fatal accident at Woolwich Arsenal, says—"It is altogether incorrect to say that guncotton cannot be exploded in the wet condition by a fulminate fuse or by friction, for it is entirely owing to this valuable discovery (published some years ago by Messrs. Abel and Brown) that most of the later applications of guncotton, such as its use for torpedoes and in mining, have been rendered possible. Wet guncotton can be readily exploded by the fulminate fuse or by percussion."—The Woolwich Reporter of the *Daily News* replies—"Despite the statement of Mr. Spiller, that 'it is altogether incorrect to say that guncotton cannot be exploded in the wet condition by a fulminate fuse,' it is nevertheless a fact that wet guncotton cannot be exploded by a fulminate fuse. Dry guncotton readily detonates with a fuse; the wet material will not do so. To effect the detonation of wet guncotton the fuse must be first of all inserted in a dry charge, or primer, and this latter, on exploding, detonates the wet material in contact with it. Herein lies the great advantage of wet guncotton: it is necessary to employ a somewhat complicated method to bring about its explosion."

IRONMAKING IN AMERICA.—We know of no larger yield of iron by an anthracite furnace than that of one of the stacks of the Coleraine Iron Company, at Redington, Northampton county, Pa. This stack, which is 60 feet high and 18 ft. 6 in. wide, made in 1874, running every day, 13,193 gross tons of pig iron, or an average of 253½ tons a week and 36 1-7 tons a day. The iron was made from the lean native hematite ore mixed with one-fourth to one-third of New Jersey magnetic. The quality of the product was as follows: 873½ tons of Nos. 1 and 2 foundry iron; 357½ tons gray forge; and 885 tons white and mottled.—*Bulletin of the American Iron and Steel Association.*

The largest beam of iron ever rolled in America has been forged by the Union Iron Company of Buffalo. The "beam pile" when charged into the heating furnace was 13 ft. 6 in. in length, weighing 3800 lbs., and made when rolled a 15 in. beam, 52 ft. long, weighing 200 lbs. to the yard, or a total of 5467½ lbs. The pile was drawn from the furnace, was passed nine times through the rolls, and afterwards cut and "hot straightened" in 5½ minutes. The train on which this heavy work was performed is what is known as a "three-high," the rolls being 21 in. in diameter, and driven by a "condensing-engine" of 45 in. in diameter of cylinder and stroke.

A GRAND PROJECT.—Mr. Charles B. King, an engineer from London, is visiting Colorado for the purpose of examining our mines, and is more pleased with what he has seen. The Heaton Tunnel received his attention, and from him we learn that the idea of completing the stupendous undertaking has not been abandoned. On the contrary, Mr. King states that it is proposed soon to resume operations on a largely increased capital, the interest on which, amounting to \$250,000 per annum, will be expended each year without trenching on the principal. The tunnel has been carried 108 ft. into the bowels of the range. As originally projected, it was to have been 12 miles in length.—*Rocky Mountain News*, Denver, May 7.

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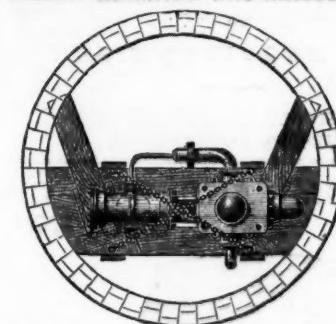
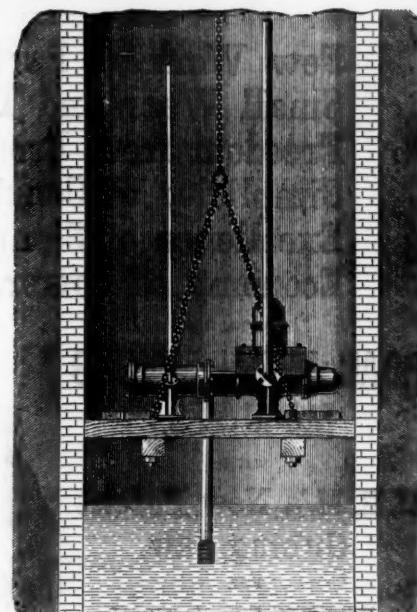
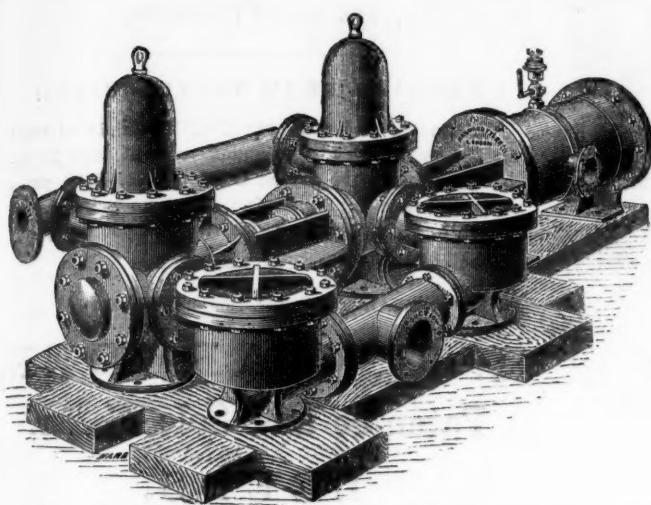
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Mr. COULTAS DODSWORTH, of Haydon Bridge, writes, on the 15th

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Mr. MONTAGUE BEALE, Managing Director of the Cagliari Mining Company (Limited), says, on May 15th, 1873:—"I have much pleasure in speaking of the great efficiency of your 'Patent Dressing Machinery,' as erected by you at our mines at Rossa, in the Island of Sardinia. You will remember it has always been considered impossible to dress, or rather separate, the minerals our ores contain by machinery, but our captain assures me he gets a constant return of 76 per cent. of lead with the greatest ease, and I know by the returns we are realising the best market price. I consider this company is much indebted to you for the success you have achieved at so small cost. It may interest you to know, from my experience in several of the British possessions, including the whole of the Australian Colonies, that my opinion is I have never seen any dressing machinery that can efficiently, and at so small a cost, dress, and separate metallic ores, however close the mechanical mixture may be, as yours. You can use this letter in any way you like."

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For WATER SUPPLY to TOWNS, LAND IRRIGATION, and MINERAL EXPLORATIONS, may be executed of any diameter, from 6 in. to 36 in., and to any depth to 2000 ft.

Pistons & Air-pump Buckets fitted with Patent Elastic Metallic Packing

of which upwards of 7500 have been made to March, 1874.

MATHER AND PLATT,

MAKERS OF LARGE PUMPS AND PUMPING ENGINES.

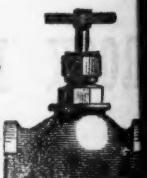
Improved Valves and Taps for Water, Steam, Gas, &c.

PATENT STEAM EARTH-BORING MACHINE

ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and FINISHERS.

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THOMAS WARDEN & SON,
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SECOND-HAND RAILS, AND EVERY DESCRIPTION OF RAILWAY, COLLIERY, AND CONTRACTORS PLANT

ALWAYS ON HAND.

CHARLES PRICE AND CO.'S
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THIS OIL is suitable to every kind of Machinery; it is used almost exclusively in Her Majesty's Dockyards and Fleet, and by the War Office and East India Government; as well as by the Royal Mail Steam Packet Co., Pacific Steam Navigation Co., P. and O. Co., Cunard Co., and by most of the other important Royal Mail Steam Fleets in the kingdom. It is also extensively employed on the various railways, and by many of the leading engineering and manufacturing firms at home and abroad.

"I hereby certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is calculated, indeed, to protect metallic surfaces from oxidation, and, from its peculiar character, is not liable to lead to spontaneous combustion of cotton waste or any similar material which might become imbued with it, as is the case with Rape, Gallipoli, and Olive Oils. The lubricating power of this oil is equal to Sperm or Lard Oil."

T. W. KEATES, F.C.S., &c., &c., Consulting Chemist to the Board of Works."

Extract from Mr. BAXTER'S Speech in the House of Commons, May 31st, 1870:—

"Chas. Price and Co.'s Rangoon Oil, a vastly superior article" (speaking of Gallipoli Oil at £72 per ton) "was obtained for from £40 to £45 per ton."

Every parcel of the Oil sent from the Works bears the Trade Mark of the Firm, and as many spurious imitations of the Rangoon Engine Oil are sold purchasers are requested to observe that none is genuine which does not bear this mark.

Oil, Tallow, and Colour Merchants, Seed Crushers, Turpentine Distillers, &c.

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